

Abstract Submitted  
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**Complex-scaling of screened Coulomb potentials for resonance calculations utilizing the modified Bessel functions**<sup>1</sup> LI-GUANG JIAO, YEW KAM HO, Institute of Atomic and Molecular Sciences — The screened Coulomb potential (SCP) has been extensively used in atomic physics, nuclear physics, quantum chemistry and plasma physics. However, an accurate calculation for atomic resonances under SCP is still a challenging task for various methods. Within the complex-scaling [1] computational scheme, we have developed a method utilizing the modified Bessel functions to calculate doubly-excited resonances in two-electron atomic systems with configuration interaction-type basis. To test the validity of our method, we have calculated *S*- and *P*-wave resonance states of the helium atom with various screening strengths, and have found good agreement with earlier calculations using different methods [2, 3]. Our present method can be applied to calculate high-lying resonances associated with high excitation thresholds of the He<sup>+</sup> ion, and with high-angular-momentum states. The derivation and calculation details of our present investigation together with new results of high-angular-momentum states will be presented at the meeting.

- [1] Y. K. Ho, *Phys. Rept.* **99**, 1 (1983), and references therein;
- [2] S. Kar and Y. K. Ho, *Phys. Rev. A* **72**, 010703 (2005);
- [3] S Chakraborty and Y. K. Ho, *Eur Phys. J. D* **49**, 59 (2008)

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